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Leicester County Council

Barton Road, Barlestone

ECOLOGICAL APPRAISAL

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1.0 INTRODUCTION

- 1.1 Leicester County Council commissioned FPCR Environment and Design Ltd. to complete an ecological appraisal of land located to the north of Barton Road, Barlestone (central OS grid reference SK 419 056).
- 1.2 The objective of the study was to determine habitats and species present within the site and to make an assessment of their ecological value and any potential ecological constraints to future residential development. In addition, and where appropriate, the need for additional surveys have been identified along with consideration of opportunities for ecological mitigation and enhancements within any future development design.
- 1.3 The site is located on the western fringe of Barlestone and is bound the south by Barton Road and to the east existing housing, beyond which lies Barlestone. The site is bound to the west by the A447 whilst the northern boundary runs through arable land and is not demarcated on the ground, beyond which lies further agricultural land.
- 1.4 The site itself comprised arable land with thin semi-improved field margins, hedgerows, scrub, trees and a pond.

Proposals

- 1.5 The site is proposed for residential development with access and public open space.

2.0 METHODOLOGY

Desk Study

- 2.1 In order to compile existing baseline information for the study area, relevant ecological information was requested from the Leicestershire and Rutland Environmental Records Centre (LRERC).
- 2.2 In addition, the following resources were interrogated for additional information and context:
 - Multi Agency Geographic Information for the Countryside (MAGIC) website¹;
 - Colour 1:25,000 OS base maps²; and
 - Aerial photographs from Google Earth³.
- 2.3 The geographical extent of the search area for biodiversity information was related to the significance of sites and species and potential zones of influence which might arise from development within the site. The consultation exercise was completed using the following scales, considered to be appropriate for the proposed development:
 - 15km around the site boundary for sites of International Importance (e.g. Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites);
 - 2km around the site boundary for sites of National or Regional Importance (e.g. Sites of Special Scientific Interest (SSSI), National or Local Nature Reserves (NNR/LNR)); and
 - 1km around the site for non-statutory designated sites of County Importance (e.g. Local Wildlife Sites (LWS)) and protected or otherwise notable species records (including species of Principal Importance under S41 of the Natural Environment and Rural Communities (NERC) Act (2006))⁴, with data from the last 20 years used.

Field Survey

Flora

Phase 1 Habitat Survey

- 2.4 A Phase 1 Habitat survey was completed on the 6th September 2019 using the standard Extended Phase 1 Habitat Survey Methodology⁵, as recommended by Natural England. This comprised a walkover of the site, mapping and broadly describing the principal habitat types and identifying the dominant plant species present within each habitat type and any invasive weeds (where present). Whilst the plant species lists obtained should not be regarded as exhaustive, sufficient information was obtained to determine broad habitat types.

Hedgerows

- 2.5 Hedgerows were surveyed using the Hedgerow Evaluation and Grading System (HEGS)⁶. The aim of the assessment is to allow the rapid recording and ecological appraisal of any given site in the UK, and to allow the grading of the individual hedges present, in order to identify those which

¹ [Online]. <http://www.magic.gov.uk/>

² [Online]. www.ordnancesurvey.co.uk

³ [Online]. www.maps.google.co.uk

⁴ *The Natural Environment and Rural Communities Act 2006*. [Online]. London: HMSO Available at: <http://www.legislation.gov.uk/ukpga/2006/16/contents>

⁵ JNCC. 2010. Handbook for Phase 1 habitat survey – a technique for environmental audit. Peterborough.

⁶ Clements, D. and Toft, R. 1992. *Hedgerow Evaluation and Grading System (HEGS), A methodology for the ecological survey, evaluation and grading of hedgerows*.

are likely to be of greatest significance for wildlife. This method of assessment includes noting down: canopy species composition, associated ground flora and climbers; structure of the hedgerow including height, width and gaps and associated features including number and species of mature tree and the presence of banks, ditches and grass verges.

- 2.6 Using the HEGS methodology each hedgerow can then be given a grade. These grades are used to assign a nature conservation value to each hedgerow as follows:
- Grade -1, 1, 1+ High to Very High Value
 - Grade -2, 2, 2+ Moderately High to High Value
 - Grade -3, 3, 3+ Moderate Value
 - Grade -4, 4, 4+ Low Value
- 2.7 Hedgerows graded -2 or above are suggested as being a nature conservation priority.
- 2.8 The hedgerows were also assessed for their potential ecological value under the Hedgerow Regulations 1997 (Statutory Instrument No: 1160). Briefly, each hedgerow is evaluated by determining both the average number of woody native species present per 100m and the number of hedgerow associated features. These results were compared against the nature conservation criteria of the Hedgerow Regulations to ascertain whether a hedgerow is classed as 'Important' under these regulations. An assessment of archaeological importance as defined under the Hedgerow Regulations 1997 was beyond the scope of this assessment.
- 2.9 All hedgerows were also assessed as to whether they qualified as Habitats of Principal Importance (Priority Habitats), i.e. whether they consisted of 80% or more native species.

Fauna

- 2.10 During the Phase 1 Habitat Survey of the site, observations, signs of or suitable habitat for any species protected under Part I of the Wildlife and Countryside Act 1981 (*as amended*), the Conservation of Habitats & Species Regulations 2017 and the Protection of Badgers Act 1992 were recorded. Consideration was also given to the existence and use of the site by other notable fauna such as Schedule 1 bird species, breeding birds, species of Principle Importance under Section 41 of the NERC Act (2006), and Local Biodiversity Action Plan (LBAP) or Red Data Book (RDB) species.

Badgers *Meles meles*

- 2.11 The standard methodology as recommended by Harris, Creswell and Jefferies⁷ was followed to complete a thorough search for evidence which would indicate the presence of badgers both on the site and locally. Evidence of badger occupation and activity sought included:
- Setts: including earth mounds, evidence of bedding and runways between setts;
 - Latrines: often located close to setts, at territory boundaries or adjacent to favoured feeding areas;
 - Prints and paths or trackways;
 - Hairs caught on rough wood or fencing;

⁷ Harris, S., Creswell, P. & Jefferies, D. 1989. *Surveying for badgers. Occasional Publication of the Mammal Society No. 9.* Mammal Society: Bristol.

- Other evidence: including snuffle holes, feeding and playing areas and scratching posts.
- 2.12 Where setts are found, their status and level of activity is noted. Sett status is broadly categorised as follows:
- *Main sett* – usually continuously used with many signs of activity around, a large number of holes and conspicuous spoil mounds;
 - *Annexe sett* – usually located close to a main sett and connected to it by well used paths. Annexe's may not be continuously occupied;
 - *Subsidiary sett* – lesser used setts comprising a few holes and without associated well-used paths. Subsidiary setts are not continuously occupied; or
 - *Outlier sett* – one or two holes without obvious paths. These are used sporadically.
- 2.13 Level of activity is described as:
- *Well used* – clear of debris, trampled soil mounds and obviously active, with signs of activity such as presence of prints, dislodged guard hairs around the entrances;
 - *Partially used* – some associated debris or plants at the entrance. Could be used with minimal excavation and usually with signs of activity within the vicinity, for example, badger pathways; or
 - *Disused* – partially or completely blocked entrances.

Bats – Roosting

Ground Level Tree Assessment

- 2.14 Trees were assessed on 6th September 2019, by an experienced ecologist, from ground level for their potential to support roosting bats and to enable recommendations with respect to the proposed works. During the survey Potential Roosting Features (PRFs) for bats such as the following were sought (based on p16, British Standard BS 8596:2015)⁸:
- Natural holes (e.g. knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar;
 - Man-made holes (e.g. cavities that have developed from flush cuts or cavities created by branches tearing out from parent stems;
 - Woodpecker holes;
 - Cracks/splits in stems or branches (horizontal and vertical);
 - Partially detached, loose or platy bark;
 - Cankers (caused by localised bark death) in which cavities have developed;
 - Other hollows or cavities, including butt rots;
 - Compression of forks with occluded bark, forming potential cavities;
 - Crossing stems or branches with suitable roosting space between;
 - Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk);

⁸ British Standard BS 8596:2015. *Surveying for Bats in Trees and Woodland* – Guide, October 2015.

- Bat or bird boxes; and
- Other suitable places of rest or shelter not listed above.

2.15 Based on the above, trees were classified into general bat roost potential groups based on the presence of these features. Table 1 broadly classifies the potential categories as accurately as possible and briefly discusses the relevance of the features. The table is based upon Table 4.1 within Chapter 6 of the Bat Conservation Trust Good Practice Guidelines⁹.

Table 1: Bat survey protocol for trees

Classification of Tree	Description of Category and Associated Features (based on PRFs listed above)	Likely Further Survey work
Confirmed Roost	Evidence of roosting bats in the form of live / dead bats, droppings, urine staining, mammalian fur oil staining, etc.	A Natural England derogation licence application will be required if the tree or roost site is affected by the development or proposed arboricultural works. This will require a combination of aerial assessment by roped access bat workers (where possible, health and safety constraints allowing) and nocturnal survey during appropriate periods (e.g. nocturnal survey - May to August) to inform on the licence. Works to a tree undertaken under supervision in accordance with the approved good practice method statement provided within the licence. However , where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may be possible.
High Potential	A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc.) and surrounding habitat. Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.	Where the tree(s) will likely be affected by development a combination of aerial assessment by roped access bat workers (if appropriate) and / or nocturnal survey during appropriate period (May to August). Following additional assessments, tree may be upgraded or downgraded based on findings. If roost sites are confirmed and the tree or roost is to be affected by proposals a licence from Natural England will be required. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may be appropriate.
Moderate Potential	A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status). Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.	Where the tree(s) will likely be affected by development a combination of aerial assessment by roped access bat workers and / or nocturnal survey during appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate. If a roost site/s is confirmed a licence from Natural England will be required.

⁹ Bat Conservation Trust 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd Edition*. Bat Conservation Trust, London.

Classification of Tree	Description of Category and Associated Features (based on PRFs listed above)	Likely Further Survey work
Low Potential	A tree of sufficient size and age to contain Potential Roosting Features but with none seen from ground or features seen only very limited potential. Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.	No further survey required but a precautionary working method statement may be appropriate.
Negligible / No potential	Negligible / no habitat features likely to be used by roosting bats	None.

* The Conservation of Habitats & Species Regulations 2017 affords protection to “breeding sites” and “resting places” of bats. The EU Commission’s Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC, February 2007 states that these are places “where there is a reasonably high probability that the species concerned will return”.

Bats –Foraging / Commuting Bats

Activity Transect Surveys

- 2.16 The primary objectives of transects completed was to identify foraging areas, commuting routes and species utilisation of the development and adjacent area.
- 2.17 This methodology takes into account the statutory guidance from English Nature (now Natural England)¹⁰ and further guidelines introduced by the Bat Conservation Trust¹¹ and JNCC¹². The survey effort was determined from recommendations provided in BCT guidance.
- 2.18 The transect route was determined prior to survey in order to comprehensively cover all areas of the site/additional survey area and included point count stops to identify activity levels around the features of potential value to bats that are to be most affected by the development proposals (i.e.: hedgerows, trees, scrub etc.) (see Figure 3-4). Point count stops were incorporated into the transect to provide further information regarding bat activity levels. Each point count was a minimum of five minutes long, during which time all bat activity was recorded. The transects commenced approximately at sunset and were each a minimum of two hours in duration.
- 2.19 Each transect was walked at a steady pace and when a bat passed by the species, time and behaviour was recorded on a site plan. This information helps to form a general view of the bat activity present on site and highlights what habitats types are associated with bat activity. Wildlife Acoustics Inc. Echo Meter Touch® bat detectors were used in conjunction with Echo Meter Touch® app and Apple Inc. iPad®.
- 2.20 Post-survey, bat calls were analysed using BatSound® Pro (Pettersson Elektronik) software package or Kaleidoscope© (Wildlife Acoustics) software package, by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. From this, the level of bat activity across the site in relation to the abundance of individual species foraging and commuting along habitats was assessed.

¹⁰ Mitchell-Jones A.J, 2004. *Bat Mitigation Guidelines*. English Nature, Peterborough.

¹¹ Collins, J. (ed.), 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. The Bat Conservation Trust, London.

¹² Mitchell-Jones A.J. and McLeish A.P. 2004. *The Bat Workers' Manual 3rd Edition*. JNCC, Peterborough.

- 2.21 All transects were undertaken when conditions were suitable (i.e. when the ambient air temperature exceeded 10°C and there was little wind and no rain) see Table 2.

Table 2: Bat Activity Transect Survey Conditions

Survey date	Sunset/Sunrise	Temperature °C	Rain	Wind (0-5)	Cloud %
16.08.19	20:32	16-14°C	0	2	0-30
12.09.19	19:28	17-15°C	Started raining at end of survey	1-2	100

Automated Surveys

- 2.22 Static passive recording broadband detectors were deployed on site during 2019 to supplement the manual transect surveys in accordance with industry guidance¹³.
- 2.23 Passive monitoring was undertaken using an automated logging system (Wildlife Acoustics Inc. Song Meter® SM2BAT+ bat detectors, herein referred to as SM2BAT+ detectors) with the output saved to an internal storage device. A single SM2BAT+ device was either placed within areas of suitable habitat to be affected by the proposed development, during each survey month.
- 2.24 The detectors were programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes following sunrise. Each was set to record over an extended period of time (minimum of five consecutive nights) of suitable and/or typical weather conditions.
- 2.25 If the detectors recorded for more than 5 nights, only the first 5 nights are analysed within this report, however the remaining nights were checked for any additional species recorded, especially notable species (e.g. Annex II species).
- 2.26 The recorded data was analysed using the Kaleidoscope© and BatSound® Pro software packages. The automated static detector surveys were undertaken over the periods 16th – 22nd August and 6th – 11th September 2019, during which the weather conditions were typical for the season and the resultant dataset is therefore considered to be representative of bat activity at these times of year.

Great Crested Newts

Habitat Suitability Index

- 2.27 As part of the phase 1 habitat survey a Habitat Suitability Index (HSI) assessment was undertaken of the on-site waterbody (P1). This assessment provides a measure of the likely suitability that a water-body has for supporting great crested newts (GCN) *Triturus cristatus*^{14,15}. Whilst not a direct indication of whether or not a water body will support GCN, generally those with a higher score are more likely to support this species than those with a lower score, and there is a positive correlation between HSI scores and ponds in which GCN are recorded. Ten separate attributes are assessed for each pond to calculate the suitability of the ponds to support GCN:

¹³ Collins, J. (ed.), 2016. *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

¹⁴ Oldham et al., October 2000. Evaluating the Suitability of Habitats for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10 (4).

¹⁵ ARG UK Advice Note 5 *Great Crested Newt Habitat Suitability Index*, Amphibian and Reptile Groups of the UK, May 2010.

- Geographic location
- Pond area
- Pond drying
- Water quality
- Shade
- Presence of water-fowl
- Presence of fish
- Number of linked ponds
- Terrestrial habitat
- Macrophytic coverage

2.28 A score is assigned according to the most appropriate criteria level set within each attribute and a total score calculated of between 0 and 1. Pond suitability is then determined according to the scale set out in Table 1. Using the index score the predicted presence of GCN being found within a pond can be made, based on the proportion of ponds typically occupied at that suitability level.

Table 1: HSI score and suitability for supporting great crested newts

HSI score	Pond Suitability
<0.5	Poor
0.5 - 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

2.29 An assessment of the suitability of the terrestrial habitats to support GCN was completed within the subject site. Suitable terrestrial habitat includes shelter habitat such as scrub and rank vegetation and habitat that could provide suitable hibernation sites such as rubble piles or tussock grassland.

3.0 RESULTS

Desk Study

- 3.1 Locations of statutory and non-statutory sites referred to in the following section are illustrated on Figure 1, with summary details set out in Table 3.

Statutory Designated Sites

- 3.2 A single internationally designated site, River Mease Special Area of Conservation (SAC) was identified within 15km of the site and is located approximately 8.5km north west at its closest point. This SAC comprises inland waterbodies (standing and running water) and is designated for supporting the Annex II species spined loach *Cobitis taenia* and bullhead *Cottus gobio*. The SAC also supports the Annex II species white-clawed crayfish *Austropotamobius pallipes* and otter *Lutra lutra*, albeit these are not primary reasons for site designation.
- 3.3 No nationally ecological statutory designations were identified within 2km.

Non-statutory Sites

- 3.4 Five notified, potential or candidate Local Wildlife Sites (LWS) have been identified within 1km of the site of which the only notified LWS is Black Poplar LWS, located 740m north of the site.
- 3.5 In addition, a number of historic LWS have also been identified within 1 km of the site. The names and distance from site of all non-statutory designations within 1km are set out in Table 4 (no further details about the sites were provided by LRERC).

Table 4: Non-statutory Designated Sites

Site Name (Ref: Fig 1)	Designation	Approximate Distance & Relative Direction	Summary Description
Local Wildlife Site: Notified / Candidate / Potential			
Barlestone, Bosworth Road Hedge (North Side)	LWS (Candidate)	600m SE	Species rich hedgerow.
Barlestone, the Fulford Pond	LWS (Potential)	730m SE	Large pond with large population of toads <i>Bufo bufo</i> .
Black Poplar	LWS (Notified)	740m N	Black poplar tree.
Barlestone, Main St Hedgerow	LWS (Potential)	840m E	Hedgerow
May Meadow and Adjacent Sites	LWS (Potential)	890m E	Area comprising marsh and tall herbs along with ponds, scrub, wet woodland and a small stream.
Barlestone, marshland Along Stream Towards Osbaston	LWS (Potential: recent)	910m SE	Small area of marsh which was could not be surveyed (visible from path).
Local Wildlife Site: Potential/Historic			
Rough Grassland and Tall Herbs	LWS (Potential:historic)	125m S	Grassland – no recent survey so unknown if site still has value.
Osbaston, Woodland and Marsh Along Stream N Of Lount Rd	LWS (Potential:historic)	410m NW	Small river/stream – no recent survey so unknown if site still has value.
Osbaston Hollow Marsh	LWS (Potential:historic)	420m N	Swamp – no recent survey so unknown if site still has value.
Marsh	LWS (Potential:historic)	580m SE	Swamp – no recent survey so unknown if site still has value.

Site Name (Ref: Fig 1)	Designation	Approximate Distance & Relative Direction	Summary Description
Hedge	LWS (Potential:historic)	660m NW	Hedgerow – no recent survey so unknown if site still has value.
Barlestone, Pond	LWS (Potential:historic)	680m NE	Pond – no recent survey so unknown if site still has value.
Osbaston, Woodland S Of Osbaston House Farm	LWS (Potential:historic)	700m SW	Woodland – no recent survey so unknown if site still has value.
Marsh and Grassland	LWS (Potential:historic)	760m SE	Wet Grassland – no recent survey so unknown if site still has value.
Goatham Plantations, Lake and Grasslands	LWS (Potential:historic)	815m S	Standing water / lake – no recent survey so unknown if site still has value.

Protected and Notable Species

- 3.6 A summary of the records relevant to this assessment are provided below and locations shown at Figure 1.

Badger

- 3.7 A number of records for badger were returned during the desktop study, of which the closest is located approximately 85m north of the site and comprises a main sett record dated 2010.

Bats

- 3.8 A number of bat records were returned by the LRERC from within 1km of the site. Species recorded including common pipistrelle *Pipistrellus pipistrellus*, brown long-eared bat *Plecotus auratus*, noctule *Nyctalus noctula*, unidentified *Myotis* sp., Leisler's *Nyctalus leisleri*, unidentified *Nyctalus* sp., soprano pipistrelle *Pipistrellus pygmaeus* and unidentified bat species. Of these the closest record to the site was a common pipistrelle roost (no further details given) located approximately 310m south east of the site and dated 2016.

Other Mammals

- 3.9 A small number of records of other notable mammals were returned during the desktop study, comprising hare *Lepus europaeus*, hedgehog *Erinaceus europaeus* and water vole *Arvicola amphibious*. Of these, the closest to the site is a hedgehog located approximately 645m east of the site.

Reptiles and Amphibians

- 3.10 No reptile records were returned from within 1km of the site.
- 3.11 No great crested newt were returned by LRERC within 1km of the site.
- 3.12 A single amphibian record was returned within 1km of the site; a toad *Bufo bufo* record located approximately 790m south east of the site and dated 2013.

Birds

- 3.13 A number of protected or notable bird records were returned by LRERC within 1km comprising bullfinch *Pyrrhula pyrrhula*, curlew *Numenius arquata*, dunnoek *Prunella modularis*, herring gull *Larus argentatus*, house martin *Delichon urbicum*, house sparrow *Passer domesticus*, reed bunting *Emberiza schoeniclus*, skylark *Alauda arvensis*, song thrush *Turdus philomelos*, starling *Sturnus vulgaris*, swallow *Hirundo rustica*, swift *Apus apus*, yellowhammer *Emberiza citrinella*, fieldfare

Turdus pilaris, firecrest *Regulus ignicapilla*, greylag goose *Anser anser*, peregrine *Falco peregrinus* and redwing *Turdus iliacus*. Most of these records were taken from three locations within or on the edge of Barlestone village, to the south east of the site (See Figure 1).

- 3.14 A number of these species were also returned within the adjacent 1km grid square.

Field Survey

Phase 1 Habitat Survey (Figure 2 & Appendix 1)

- 3.15 Habitat descriptions of the site are provided below, with habitat locations described in Figure 2. A list of botanical species recorded is provided in Appendix A.

Arable Lane

- 3.16 The site comprised the southern part of two adjacent arable fields, sown with Italian rye-grass *Lolium multiflorum* at the time of survey. Occasional are rarely occurring herbaceous species were also recorded within the sward, including white clover *Trifolium repens*, dandelion *Taraxacum officinale* agg., daisy *Bellis perennis*, broad-leaved dock *Rumex obtusifolius*, creeping thistle *Cirsium arvense* and common mouse-ear *Cerastium fontanum*.

Poor Semi-improved Grassland and Tall Ruderal Vegetation

- 3.17 The arable fields had thin (approximately 0.5-1m) poor semi-improved field margins which were dominated by false-oat grass *Arrhenatherum elatius* and Yorkshire-fog *Holcus lanatus*. Other species recorded occasionally or rarely within the field margin sward included bent *Agrostis* sp., perennial rye-grass *Lolium perenne*, common mouse-ear, field bindweed *Convolvulus arvensis* and hogweed *Heracleum sphondylium*. Horsetail *Equisetaceae* sp. was also recorded within the eastern field margin.
- 3.18 Sections of the field margin, especially along the western site boundary, were noted to be dominated by tall ruderal vegetation including common nettle *Urtica dioica* and creeping thistle *Cirsium arvense*.

Hedgerows

- 3.19 Six hedgerows were present within the site (referred to as hedgerows H1 – H6), with hedgerows H1 and H3 extending north off-site. The hedgerows across the site were largely hawthorn *Crataegus monogyna* or blackthorn *Prunus spinosa* dominated with a minimum height of 4m, except hedgerow H6 which was a domestic garden boundary dominated by non-native garden privet *Ligustrum ovalifolium* and managed to a height of approximately 1-2m.
- 3.20 Hedgerows H1 to H5 comprised at least 80% native species and therefore qualify as habitats of principal importance (as described in S41 of the NERC Act 2006). Hedgerow H6 comprised largely non-native garden privet and therefore does not qualify as a habitat of importance.
- 3.21 Hedgerows H1 to H4 were also assessed against the Hedgerow Regulations Act (1997) criteria, albeit none were considered to qualify as important under the wildlife and landscape criteria due to being species-poor and lacking associated features. Hedgerows H5 and H6 forming curtilages to adjacent residential properties were not assessed under the Hedgerow Regulations Act (1997).

- 3.22 All six hedgerows were assessed against the HEGS assessment, with the hedgerows H1 and H2 being assessed to be of 'moderate' ecological value (scores of -3, 3 or 3+) and hedgerows H3 and H4 assessed as being of 'moderately high to high' (score of -2, 2 or 2+).
- 3.23 A summary of the extent and ecological value of the hedgerows is provided in Table 5.

Table 5: Hedgerow Survey Summary

Ref	Canopy Sp.	Height / Width (m)	Length (m)	Sp. per Av. 30m	Associated Features	HEGS Grade	Import. HR ¹
H1	<i>Cm, Sn</i>	2-4 / 2-3	81	1	<10% gaps	3	N
H2	<i>Fe, Cm, Ap, Sn, Rc, Qr, Sa, Ps</i>	2-4 / 1-2	180	2	<10% gaps, at least 1 tree per 50m	3	N
H3	<i>Cm, Rc, Ps, Fe, la, Sn</i>	2-4 / 2-3	150	2	<10% gaps, ditch	-2	N
H4	<i>Ps, Fe, Ap, Cm, la, Qr, Up</i>	2-4 / 2-3	130	4	<10% gaps, at least 1 tree per 50m	2+	N
H5	<i>Cm, Up</i>	>4/ 2-3	45	2	<10% gaps, at least 1 tree per 50m	n/a	n/a
H6	<i>la, Lo</i>	1-2/0-1	45	2	<10% gaps	n/a	n/a

Species Key: *Ap* *Acer pseudoplatanus* - sycamore; *Cm* *Crataegus monogyna* – hawthorn; *Fe* *Fraxinus excelsior* – ash; *Ilex aquifolium* – holly; *Lo* *Ligustrum ovalifolium* – garden privet; *Ps* *Prunus spinosa* – blackthorn; *Qr* *Quercus rubur* – English oak; *Rc* *Rosa canina* - dog-rose; *Sa* *Salix* sp. – willow; *Sn* *Sambucus nigra* – elder; *Up* *Ulmus procera* – English elm.

Scrub and Trees

- 3.24 An area of dense scrub and trees was present within the south eastern corner of the western field parcel (Figure 2) and surrounded a pond. This scrub was dominated by blackthorn, along with elder *Sambucus nigra*, bramble *Rubus fruticosus* agg. and dog-rose *Rosa canina* scrub whilst tree specimens included mature willow *Salix* sp., ash *Fraxinus excelsior* and oak *Quercus robur*.
- 3.25 Occasional scattered scrub was also present at the field margins and included bramble, holly *Ilex aquifolium* and blackthorn.

Pond

- 3.26 A pond (P1) was present within the south eastern corner of the western field parcel, which measured approximately 7m x 5m. This pond was recorded to support a very shallow (<5cm) depth of water at the time of survey which was overgrown with duckweed at the time of survey. Limited marginal vegetation as noted, comprising floating sweet grass and ivy growing on broken branches within the pond. The pond is located within an area of scrub and trees which result in it being heavily overshadowed, with trees branches growing over the pond itself at water level.

Fauna

Badger

- 3.27 No setts were recorded within the site itself, however an active outlier badger sett was identified approximately 33m north of the site within the base of hedgerow H3 (TN1). The off-site sett was recorded to comprise a single entrance at the base of a dead tree stump with an associated spoil heap and a latrine nearby.

- 3.28 A clear path was visible within the arable field along the western side of hedgerow H3, albeit this could also be attributed to dog walkers. No other evidence for the presence of badger was recorded within the site.

Bats

Bats -Roosting

- 3.29 The majority of the trees within the site were recorded to be in good health with no features suitable to support roosting bats identified. As such, these trees were assessed as having negligible potential to support roosting bats.
- 3.30 A single oak tree located at the southern boundary had a heavy covering of ivy *Hedera helix* which obscured any potential features but also offered a limited level of potential in itself and therefore was assessed as being of low suitability to support roosting bats.

Bats - Foraging and Commuting Bats

Activity Transect Surveys (Figures 3& 4)

- 3.31 The following section provides a summary of the results recorded during the August and September 2019 nocturnal surveys across the site. A full detailed breakdown of the data, including full detailed tables and locations are provided in the associated plans and Appendices (as indicated).

16th August 2019 (Figure 3)

- 3.32 Bat activity during the August transect was dominated by common pipistrelle, along with occasional soprano pipistrelle and a single noctule bat.
- 3.33 Activity largely comprised foraging and was recorded along all the hedgerows within/ at the site boundaries. The majority of the bat activity was recorded along the boundaries of the eastern field parcel (H3, H4 and H5).

12th September 2019 (Figure 4)

- 3.34 Similar levels of bat activity were recorded in September, with activity again dominated by common pipistrelle, but with occasional soprano pipistrelle, noctule and *Myotis* sp.
- 3.35 Activity again largely comprised foraging behaviour associated with the hedgerow network, predominantly hedgerow H1 (western site boundary), H3 (centre of site) and H4 (south eastern boundary).

Static Detector Survey (Appendix B, locations in Figures 3 & 4)

16th – 21st August 2019

- 3.36 The static detector was situated within hedgerow H4 (figure 3) along the southern site boundary during the August survey and recorded a total of 3486 bat registrations. Activity recorded was dominated by common pipistrelle (c. 62.5 bats per hour and 94.5% of total registrations recorded). Other species recorded at this location comprised occasionally or rarely recorded soprano pipistrelle (122 registrations), noctule (26 registrations), *Myotis* sp. (24 registrations), *Pipistrellus* sp. (10 registrations), brown long-eared bat (eight registrations) and a single *Nyctalus* sp.

6th – 11th September 2019

- 3.37 This static detector was located within hedgerow H3, which bisects the site (see Figure 4), during the September survey. A lower level of activity was recorded in September with a total of 673 bat registrations which were again dominated by common pipistrelle (c7.5 bat registrations per hour and 66.5% of total bat registrations recorded). Other bat activity recorded in September comprised occasional *Myotis* sp. (103 registrations) and soprano pipistrelle (32 registrations) and rarely recorded noctule (29 registrations), *Pipistrellus* sp. (4 registrations) and a single brown long-eared bat.

Reptiles

- 3.38 The site was dominated by habitats of limited value to reptiles in the form of arable land. Boundary habitats however, including the field margins, hedgerows, scrub and pond provided limited opportunities for this species group.

Amphibians

- 3.39 A single pond (P1) was identified within the site and was subject to a Habitat Suitability Index (HSI) assessment. Pond P1 was assessed as being of poor suitability to support GCN, with the results given in Table 6.

Table 6: Pond P1 HSI Assessment results summary

SI -1	SI - 2	SI -3	SI -4	SI -5	SI -6	SI -7	SI -8	SI -9	SI -10			
Geographical Location	Pond Area	Pond Drying	Water Quality	Shade	Fowl	Fish	Ponds	Terrestrial Habitat	Macrophytes	HSI score	Pond Suitability	Predicted Presence
1	0.05	0.5	0.33	0.4	1	1	1	0.33	0.4	0.46	Poor	0.03

- 3.40 Examination of OS maps and publicly available aerial photographs identified a further three waterbodies (clustered together) located within 250m, albeit these were all located on private land and therefore could not be subject to a HSI assessment. In any case, the closest is located approximately 220m from the site and they are all located on the other side of a busy road (A447) which has kerbs and is considered to act as a partial barrier to GCN dispersal.
- 3.41 In terms of terrestrial habitat, the site is dominated by sub-optimal habitat (arable land) although the field margins, scrub and hedgerows do provide commuting and hibernating opportunities for this species.

Birds

- 3.42 Foraging and nesting opportunities for a range of common breeding birds, including urban and rural fringe species, are present within the site in the form hedgerows, scrub and trees.

4.0 DISCUSSION AND RECOMMENDATIONS

Designations

- 4.1 A single statutory designation, the River Mease SAC, was identified within the relevant search areas, located approximately 8.5km north west of the site. At this distance the SAC will not be subject to any direct or indirect impacts, such as land take or dust deposition, as a result of the proposed development.
- 4.2 In terms of the completed development, this designation comprises a series of waterbodies of which the majority is the River Mease itself. At this distance, any increase in recreational use as a result of the proposed development will be negligible and dispersed along its length, whilst large sections of the River Mease are not located next to public footpaths. In addition, the site is not directly linked to this SAC hydrologically.
- 4.3 As such, significant effects on this designation, and the species it is designated for, are not anticipated as a result of the proposed development.
- 4.4 No ecological statutory designations have been identified within the relevant distances from the site.
- 4.5 A single notified non-statutory ecological designation, Black Poplar LWS, was identified within 1km located approximately 740m north of the site. At this distance, this LWS will not be subject to land take or any other direct effects such as dust or pollution. In addition, given it is a single tree, this LWS is not considered to be at risk from indirect impacts such as recreational pressure. None of the other non-statutory site details were designated / confirmed to be present, and are therefore not considered further.
- 4.6 On this basis, it is considered that ecological designations do not pose a constraint to the proposed development.

Habitats

- 4.7 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:
 - Inclusion within specific policy (e.g. veteran trees, ancient woodland and linear habitats in NPPF, or non-statutory site designation),
 - Identification as a habitat of principal importance for biodiversity under the NERC Act (2006) and consequently identification as a Priority Habitat within the LBAP.
- 4.8 Under the NPPF, development should seek to contribute a net gain in biodiversity with an emphasis on improving ecological networks and linkages where possible.
- 4.9 The site is dominated by arable land with thin poor semi-improved field margins, considered to be of no more than low ecological value or botanical interest. As such, the loss of these habitats to the proposed development would not result in significant adverse impacts to ecology and nature conservation within the local area.
- 4.10 The pond at the southern site boundary is retained under the proposed development, along with the majority of the hedgerows. These retained habitats should be protected during the construction

phase, i.e. working methods should adhere to standard best practice guidance, including BS5837¹⁶ for trees and hedgerows and GPP5¹⁷ for the pond.

- 4.11 Small sections of hedgerows H3 and H4 will be lost to facilitate access (including required visibility splays) and construction of internal road. The loss of these hedgerow sections should be mitigated through new native hedgerow planting along the northern site boundary, which would more than compensate for the losses.
- 4.12 The proposed development provides the opportunity to enhance habitats within the site in the long term through the creation of wildflower grassland creation and native tree / shrub planting within the extensive area of green infrastructure proposed in the west of the site. In addition, the attenuation features should be designed to benefit wildlife, for example by incorporating shallow sloping banks and native planting.

Fauna

- 4.13 Principal pieces of legislation protecting wild species are Part 1 of the Wildlife and Countryside Act 1981 (as amended) (WCA) and the Conservation of Habitats and Species Regulations 2017 (as amended). Some species, for example badgers, also have specific protective legislation (Protection of Badger Act 1992). The impact that this legislation has on the Planning system is outlined in ODPM 06/2005 Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System.
- 4.14 This guidance states that as the presence of protected species is a material consideration in any planning decision, it is essential that the presence or otherwise of protected species, and the extent to which they are affected by proposals is established prior to planning permission being granted. Furthermore, where protected species are present and proposals may result in harm to the species or its habitat, steps should be taken to ensure the long-term protection of the species, such as through attaching appropriate planning conditions for example.
- 4.15 In addition to protected species, there are those that are otherwise of conservation merit, such as species of principal importance for the purpose of conserving biodiversity under the NERC Act (2006). These are recognised in the NPPF which advises that when determining planning applications, LPA's should aim to conserve and enhance biodiversity.
- 4.16 The findings of the surveys in relation to the development design and any potential ecological constraints are outlined below, along with opportunities to enhance the site for these species.

Badger

- 4.17 No evidence of the presence of badger was identified within the site itself, albeit an active single entrance outlier sett was recorded approximately 33m north of the site.
- 4.18 The sett is located over 20m from the northern site boundary and a such will not be directly affected by the proposed development. Heras fencing should be erected along the northern site boundary to prevent machines or workers going within 20m of the know sett.
- 4.19 Given the known presence of badger in the area, and that badgers are a mobile species which can create and abandon setts frequently, it is recommended that an update badger survey be

¹⁶ BS 5837:2012 Trees in relation to design, demolition and construction. Recommendations.

¹⁷ 2017 *Guidance for Pollution Prevention – Works and maintenance in or near water: GPP5*

undertaken prior to construction works to confirm the absence or identify any new setts, if presence, within the site.

- 4.20 In addition, precautionary working practices should be in place during construction in order to safeguard mammals including badger which may pass through the site, including:
- Covering deep excavations or providing escape ramps in deep excavation in the event such working are not infilled before nightfall; and
 - The site manager completing weekly inspections of any soil mounds for evidence of new badger activity and if any potential new setts are identified works in that area will be stopped and further advice sought from a suitability qualified ecologist.

Bats

Roosting Bats

- 4.21 The trees within the site were largely recorded to be in good condition and of negligible value to roosting bats.
- 4.22 A single oak tree located on the southern boundary was assessed as being of low suitability to support roosting bats due to a heavy covering of ivy. This tree is to be retained within the proposed scheme. It is recommended that an appropriate lighting scheme be implemented during construction and in the development long term to minimise /reduce potential impacts on individuals which may roost in the tree.
- 4.23 If the scheme changes and this tree will be lost then it will be subject to soft felling techniques including being gently cut in sections which must be left on the ground for a minimum of 24 hours to allow any bats inside to leave safely.
- 4.24 The opportunity exists to further increase roosting opportunities for bats within the site and as such it is recommended that at least three bat boxes (such as 2F Schwegler Bat Box, or similar) are erected on retained trees at the site boundary, and additional bat boxes integrated into new buildings. Bat boxes should be located at a minimum height of 3m to 6m in a south or south-west facing direction. The entrances to the bat boxes should be maintained clear and free from vegetation. Health and safety should be considered when installing bat boxes on trees.

Foraging and Commuting Bats

- 4.25 Throughout the survey work, activity was dominated by common pipistrelle, a common and widespread species, along with soprano pipistrelle, unidentified *Myotis* sp., unidentified *Pipistrellus* sp., unidentified *Nyctalus* sp. brown long-eared bat and noctule.
- 4.26 Soprano pipistrelle, brown long-eared bat and noctule are listed under Section 41 of the NERC, albeit these remain common and widespread within the UK. No Annex II species were recorded within the site during the surveys undertaken.
- 4.27 Small sections of hedgerows H3 and H4 will be lost for access / internal roads. The loss of these hedgerows will be mitigated through the planting of a new native species hedgerow / scrub across the northern site boundary, which will be greater than the total length of hedgerow lost and will create a new corridor for foraging and commuting bats across the north of the site.
- 4.28 In terms of foraging, new habitat creation with areas of public open space / green infrastructure (including scrub and tree planting and wildflower grassland) will provide enhanced opportunities

for bats which currently largely utilise the hedgerows. It is recommended that wildflower grassland be created, and native species tree / scrub planting be incorporated within the landscaping, where possible.

- 4.29 In addition, to minimise potential disturbance to both retained and newly planted habitats, it is recommended that the following be implemented during construction and incorporated into the development in order to ensure minimal light spill from the site and to maintain dark corridors:
- During the construction period no lighting is present at night;
 - Lighting is directed to where it is needed, to avoid light spillage, particularly along the hedgerows;
 - External lighting scheme that is incorporated into the development design should be designed to ensure that light spill onto vegetated areas is avoided, where possible;
 - Lighting that is incorporated into the development design should be LED luminaires due to their sharp cut-off, lower intensity, good colour rendition and dimming capability. All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used¹⁸; and
 - Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats¹⁹.

Reptiles

- 4.30 The site is dominated habitats of negligible value to reptiles and as such reptiles are not considered to pose a constraint on the proposed development.

Amphibians

- 4.31 The pond located within the site was assessed as being of poor suitability to support GCN and therefore it is considered unlikely to support GCN. This pond is to be retained and buffered from the built development within the site green infrastructure (including an attenuation feature) with the existing habitat link to the area of proposed green infrastructure in the west of the site (hedgerow H2) maintained. As such, this pond will continue to provide a resource to amphibian species such as frog *Rana temporaria* and toad.
- 4.32 Three offsite waterbodies were identified within 250m of the site, all located over 220m west of the site and separated by the A447 which is considered to be a partial barrier to dispersal. Given the distance and separation from site, it is considered highly unlikely that GCN, if present within these ponds, would be dispersing to on-site habitats.
- 4.33 In any case, the westernmost section of the site (within 250m of the off-site waterbodies) will comprise areas of green infrastructure within which it is recommended areas of wildflower grassland are created, along with native scrub planting.
- 4.34 On this basis, it is considered that GCN do not pose a constraint to the proposed development.

Birds

¹⁸ Bat Conservation Trust & Institute of Lighting Professionals (ILP) 2018. *Guidance Note 8: Bats and artificial lighting in the UK*. Bats and the Built Environment Series.

¹⁹ Stone, E.L. (2013) *Bats and lighting: Overview of current evidence and mitigation*

- 4.35 The Wildlife and Countryside Act 1981 (*as amended*) is the principal legislation affording protection to UK wild birds. Under this legislation all birds, their nests and eggs are protected by law and it is an offence, with certain exceptions to recklessly or intentionally:
- Kill, injure or take any wild bird;
 - Take, damage or destroy the nest of any wild bird while in use or being built;
 - Take or destroy the egg of any wild bird.
- 4.36 Species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (*as amended*) are specially protected at all times.
- 4.37 In addition to statutory protection, some bird species are classified according to their conservation status, such as their inclusion on the Red and Amber lists of Birds of Conservation Concern (BoCC) in the UK²⁰:
- Red list species are those that are Globally Threatened according to IUCN criteria; those whose population has declined rapidly (50% or more) in recent years; and those that have declined historically and not shown a substantial recent recovery.
 - Amber list species are those with an unfavourable conservation status in Europe; those with a population or range that has declined moderately (between 25% and 49%) in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.
 - Green list species fulfil none of the above criteria.
- 4.38 The arable fields are part of larger fields, both less than 5ha in size and surrounded by hedgerows and trees. As such, the habitats within the site provide negligible opportunities for ground nesting birds such as skylark.
- 4.39 The hedgerows, scrub and trees within the site, however, provide opportunities for a range of bird species including urban edge and farmland birds. The loss of sections of hedgerows H3 and H4 will be compensated through native hedgerow / scrub planting along the northern site boundary / within areas of green infrastructure.
- 4.40 To avoid disturbance or destruction of active nests, removal of suitable nesting vegetation should occur outside of the bird breeding season (i.e. avoiding March to September inclusive). If this is not possible, such vegetation must be checked prior to removal by a suitably experienced ecologist. If active nests are found, vegetation must be left untouched and suitably buffered from works until all birds have fledged. Specific advice should be sought prior to undertaking site clearance.
- 4.41 It is recommended that new planting within areas of green infrastructure comprise native, seed bearing species of local provenance such as hawthorn, blackthorn and dog-rose. Species such as these will provide increased foraging resources for a range of bird species within the site.
- 4.42 The opportunities also exists to enhance nesting opportunities for bird species through the provision of a range of bird nest boxes on retained trees and / or incorporated within new buildings. Bird boxes should be located at a height of 3m to 6m, avoiding a south facing direction. The entrances to the bird boxes should be maintained clear and free from vegetation. Health and safety should be considered when installing boxes on trees.

²⁰ Eaton, M.A., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. and Gregory, R.D. 2016. Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. *British Birds*. 108:708-746.

5.0 SUMMARY

- 5.1 No statutory or non-statutory designated sites are located within the site, whilst a single statutory ecological designation, the River Mease SAC (c.8.5km north west of site) has been identified within 15km of the site. The only notified non-statutory designation within 1km of the site is Black Poplar LWS (c.740m north). Given their distances from the site, the nature of these designations and the design of foul drainage within the proposed development, the identified ecological designations will not be adversely impacted by the proposed development.
- 5.2 The site itself is dominated by arable land with poor semi-improved grassland margins, both habitats of low ecological value. Other habitats present within the site include a pond, scrub, trees and hedgerows. Of these, the pond and the majority of the trees and hedgerows are retained within the proposed development. Retained features will be protected during development.
- 5.3 The loss of hedgerows for access / internal roads will be mitigated through native hedgerow / scrub planting of greater length than that lost. In addition, the opportunity exists to create new habitats of value within areas of public open space/green infrastructure including native tree/scrub planting and wildflower grassland.
- 5.4 A single entrance outlier badger sett was recorded approximately 33m north of the site. Therefore, it is recommended an updating badger survey is undertaken prior to commencement of development and precautionary working methods implemented during construction to protect individual badger which may be present within the site.
- 5.5 A single oak at the southern site boundary (within hedgerow H4) was assessed as having low bat potential. This tree is to be retained within the proposed development and it is recommended an appropriate lighting scheme implemented to reduce impacts on this tree. However, should the scheme change and this tree lost, it will be subject to soft felling techniques. No other feature suitable to support roosting bats occur within the site.
- 5.6 The hedgerows and trees within / at the site boundaries provide opportunities for foraging and commuting bats, with bat activity recorded within the site during the surveys undertaken dominated by common pipistrelle (a common and widespread species). New native hedgerow / scrub planting along the northern site boundary will provide an alternative commuting corridor for bats around the edge of the site, whilst areas of green infrastructure / open space provide the opportunity to enhance foraging resources within the site. In addition, it is recommended a sensitive lighting strategy is implemented during construction and in the long term to maintain dark commuting corridors around the edges of the site.
- 5.7 The hedgerows, trees and scrub within the site provide nesting opportunities for a range of bird species and therefore vegetation removal should be undertaken outside of the nesting bird season or preceded by a nesting bird check.
- 5.8 No other protected or notable species are considered to pose a statutory constraint to development of the site.
- 5.9 Development of the site provides the opportunity to provide habitat enhancements including:
- Native tree, scrub and hedgerow planting;
 - Wildflower grassland creation; and
 - Provision of integrated and tree mounted bat and bird boxes.

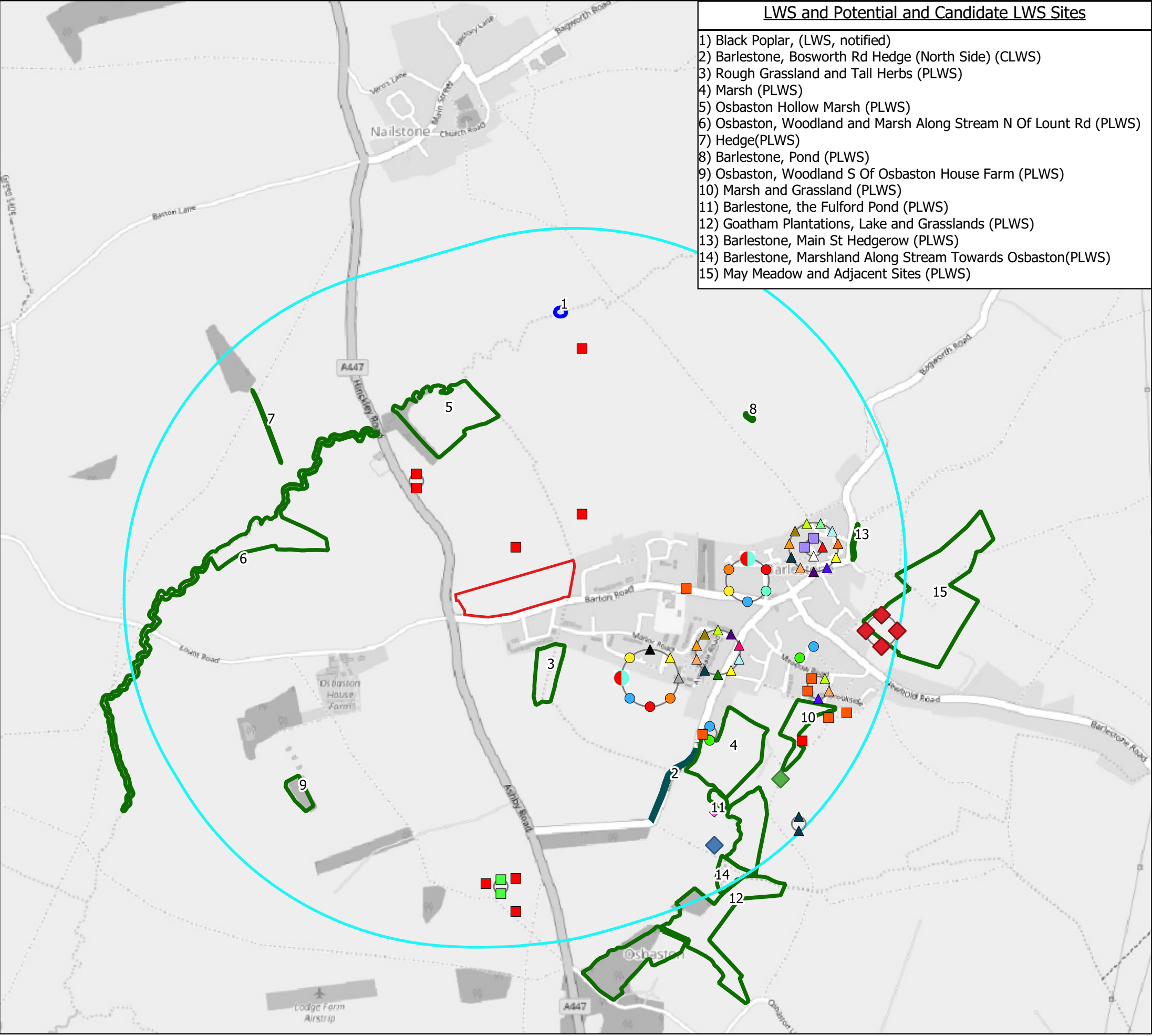
6.0 APPENDIX A: BOTANICAL SPECIES LIST

Common Name	Scientific Name	Frequency
Arable Land		
Broad-leaved dock	<i>Rumex obtusifolius</i>	R
Common mouse-ear	<i>Cerastium fontanum</i>	R
Creeping bent	<i>Agrostis stolonifera</i>	A
Creeping buttercup	<i>Ranunculus repens</i>	R
Creeping thistle	<i>Cirsium arvense</i>	R
Daisy	<i>Bellis perennis</i>	R
Dandelion	<i>Taraxacum officinale</i> agg.	R
Greater plantain	<i>Plantago major</i>	R
Italian ryegrass	<i>Lolium multiflorum</i>	O
Ribwort plantain	<i>Plantago lanceolata</i>	R/LF
White clover	<i>Trifolium repens</i>	O
Poor semi-improved Grassland and Tall Ruderal Vegetation		
Bramble	<i>Rubus fruticosus</i> agg.	R
Common mouse-ear	<i>Cerastium fontanum</i>	R
Common nettle	<i>Urtica dioica</i>	O/LD
Common ragwort	<i>Jacobaea vulgaris</i>	R
Cow parsley	<i>Anthriscus sylvestris</i>	R
Creeping thistle	<i>Cirsium arvense</i>	R
False oat-grass	<i>Arrhenatherum elatius</i>	D
Field bindweed	<i>Convolvulus arvensis</i>	R
Hogweed	<i>Heracleum sphondylium</i>	R
Horsetail	<i>Equisetaceae</i> sp.	R
Italian ryegrass	<i>Lolium multiflorum</i>	O
Perennial ryegrass	<i>Lolium perenne</i>	O
Yorkshire-fog	<i>Holcus lanatus</i>	O
White dead-nettle	<i>Lamium album</i>	R
Scrub and Trees		
Ash	<i>Fraxinus excelsior</i>	F
Blackthorn	<i>Prunus spinosa</i>	O
Bramble	<i>Rubus fruticosus</i> agg.	O
Dog-rose	<i>Rosa canina</i>	
Elder	<i>Sambucus nigra</i>	R
English elm	<i>Ulmus procera</i>	R
English oak	<i>Quercus robur</i>	O
Holly	<i>Illex aquifolium</i>	R
Sycamore	<i>Acer pseudoplatanus</i>	O
Willow	<i>Salix</i> sp.	A

Key: D: Dominant A: Abundant F: Frequent O: Occasional R: Rare

APPENDIX B: AUTOMATED DETECTOR RESULTS

Survey dates	Total Registrations	Common Pipistrelle			Soprano Pipistrelle			Myotis Species			Noctule			Pipistrellus Species			Brown Long-eared bat			Nyctalus Species		
		Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour
16/08/19 21/08/19	3295	3295	960	62.58	122	40	2.32	24	12	0.46	26	11	0.49	10	6	0.19	8	2	0.15	1	1	0.02
06/09/19 11/09/19	447	447	123	7.51	89	21	1.49	103	76	1.73	29	17	0.49	4	3	0.07	1	1	0.02	0	0	0.00



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Key

- Site Boundary
- 1 KM Buffer
- Local Wildlife Sites (LWS)
- Candidate LWS
- Potential LWS

Species

- | | |
|----------------------|---------------------|
| Bat | Hedgehog |
| Brown Long-eared Bat | Hare |
| Myotis Bat species | Bullfinch |
| Noctule Bat | Curlew |
| Lesser Noctule | Duncock |
| Nyctalus Bat species | Herring Gull |
| Soprano Pipistrelle | House Martin |
| Common Pipistrelle | House Sparrow |
| Smooth Newt | Reed Bunting |
| Common Toad | Skylark |
| Grass Snake | Song Thrush |
| Fieldfare | Starling |
| Firecrest | Swallow |
| Greylag Goose | Swift |
| Peregrine | Yellowhammer |
| Redwing | Nuttall's Waterweed |
| Badger | Canadian Waterweed |
| Water Vole | Giant Hogweed |
| | Himalayan Balsam |

client
Leicester County Council

project
Barton Road, Barlestone

drawing title
Site Location and Consultation Plan

scale
1:12000

drawn
JR/ AJR

issue
8/10/2019

rev

Figure 1

9171- E - 01

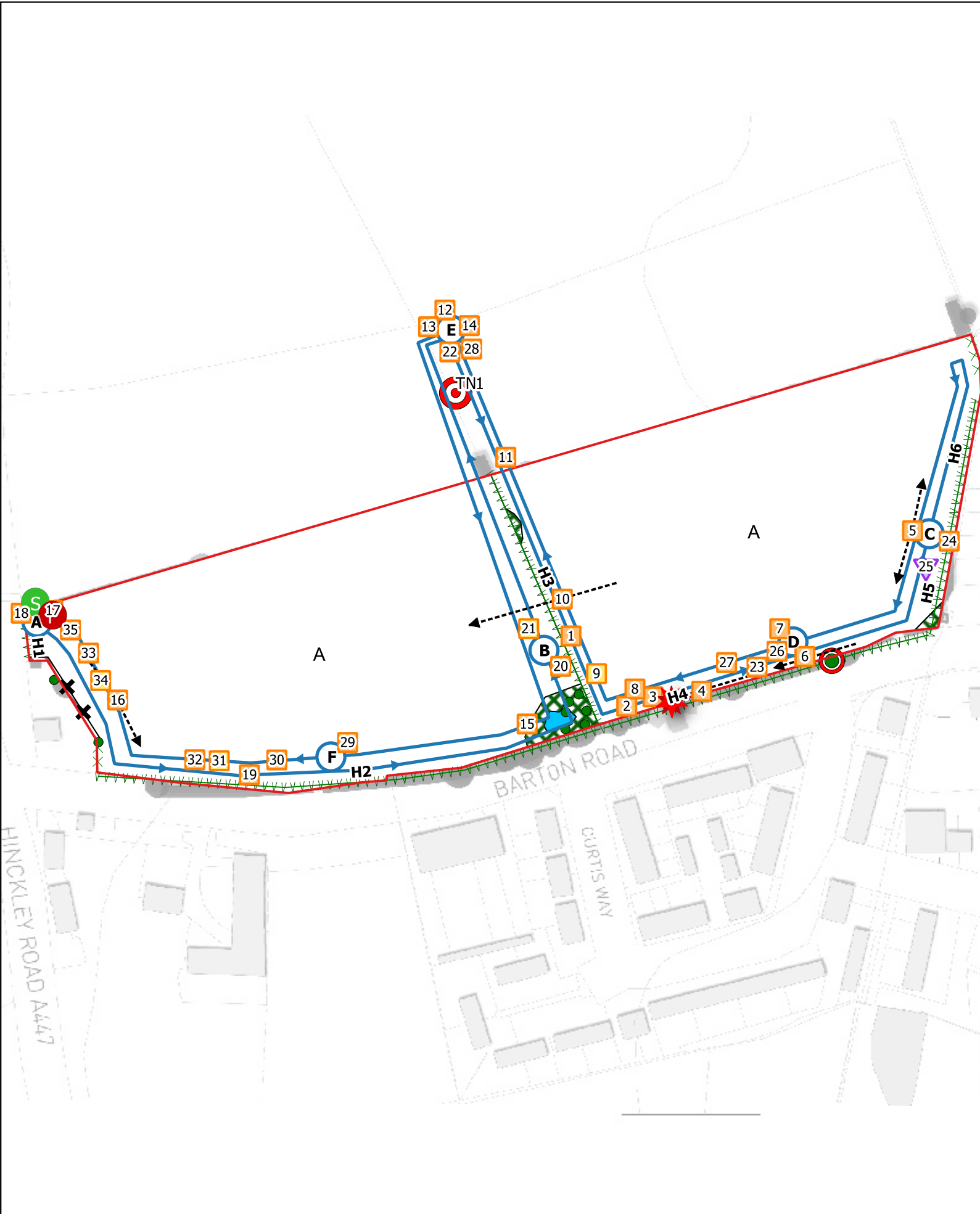


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Key

- Site Boundary
- Arable land
- Tall ruderal vegetation
- Scrub - dense/continuous
- Pond
- Hedgerow
- Scrub - scattered line
- Scrub - scattered
- Tree with bat potential
- Target note
- Broadleaved tree



Ref	Time	Bat Species	Behaviour	Passes
PC A	20:34-20:39	No bats		
PC B	20:44 - 20:49	No bats		
1	20:54:00	Common pipistrelle	Commuting	3
2	20:55:00	Common pipistrelle	Foraging	4
3	20:57:00	Common pipistrelle	Commuting	1
4	20:58:00	Common pipistrelle	Foraging	7
PC C	21:01-21:06	Ref. 5		
5	21:01:00	Common pipistrelle	Foraging	5
PC D	21:10 - 21:15	Ref. 6, 7		
6	21:10:00	Common pipistrelle	Foraging	2
7	21:14:00	Common pipistrelle	Commuting	1
8	21:16	Common pipistrelle	Foraging	7
9	21:16	Soprano pipistrelle	Commuting	1
10	21:17	Common pipistrelle	Commuting	1
11	21:18	Common pipistrelle	Commuting	1
PC E	21:20-21:26	Ref. 12, 13, 14		
12	21:20	Common pipistrelle	Foraging	22
13	21:23	Common pipistrelle	Foraging	3
14	21:26	Common pipistrelle	Foraging	9
15	21:29	Common pipistrelle	Foraging	2
PC F	21:31-21:36	No bats		
16	21:37	Common pipistrelle	Foraging	10
17	21:39	Common pipistrelle	Foraging	13
PC A	21:40-21:45	Ref. 18		
18	21:43	Common pipistrelle	Foraging	2
19	21:47	Common pipistrelle	Foraging	4
PC B	21:49-21:54	Ref. 20, 21		
20	21:50	Common pipistrelle	Foraging	6
21	21:53	Soprano pipistrelle	Commuting	2
22	21:57	Common pipistrelle	Foraging	2
23	22:00	Common pipistrelle	Commuting	1
PC C	22:01-22:06	Ref. 24, 25		
24	22:02	Common pipistrelle	Foraging	16
25	22:05	Noctule	Commuting	1
PC D	22:08-22:13	Ref. 26		
26	22:09	Common pipistrelle	Foraging	6
27	22:14	Common pipistrelle	Commuting	2
PC E	22:16-22:21	Ref. 28		
28	22:20	Common pipistrelle	Foraging	1
PC F	22:25-22:30	Ref. 29		
29	22:25	Common pipistrelle	Foraging	Cont.
30	22:29	Common pipistrelle	Foraging	7
31	22:33	Soprano pipistrelle	Commuting	2
32	22:33	Common pipistrelle	Foraging	6
33	22:34	Common pipistrelle	Foraging	4
34	22:34	Soprano pipistrelle	Foraging	7
35	22:35	Common pipistrelle	Foraging	3

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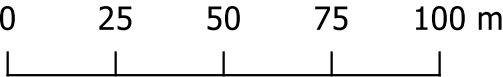
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Key:

- Site Boundary
- Transect Route
- Start point
- Finish point
- Flight Arrow
- Static
- Point count locations

Bat Contacts

- Common Pipistrelle
- Soprano Pipistrelle
- Noctule



client
Leicester County Council

project
Barton Road,
Bareston

drawing title
BAT TRANSECT PLAN (August 2019)

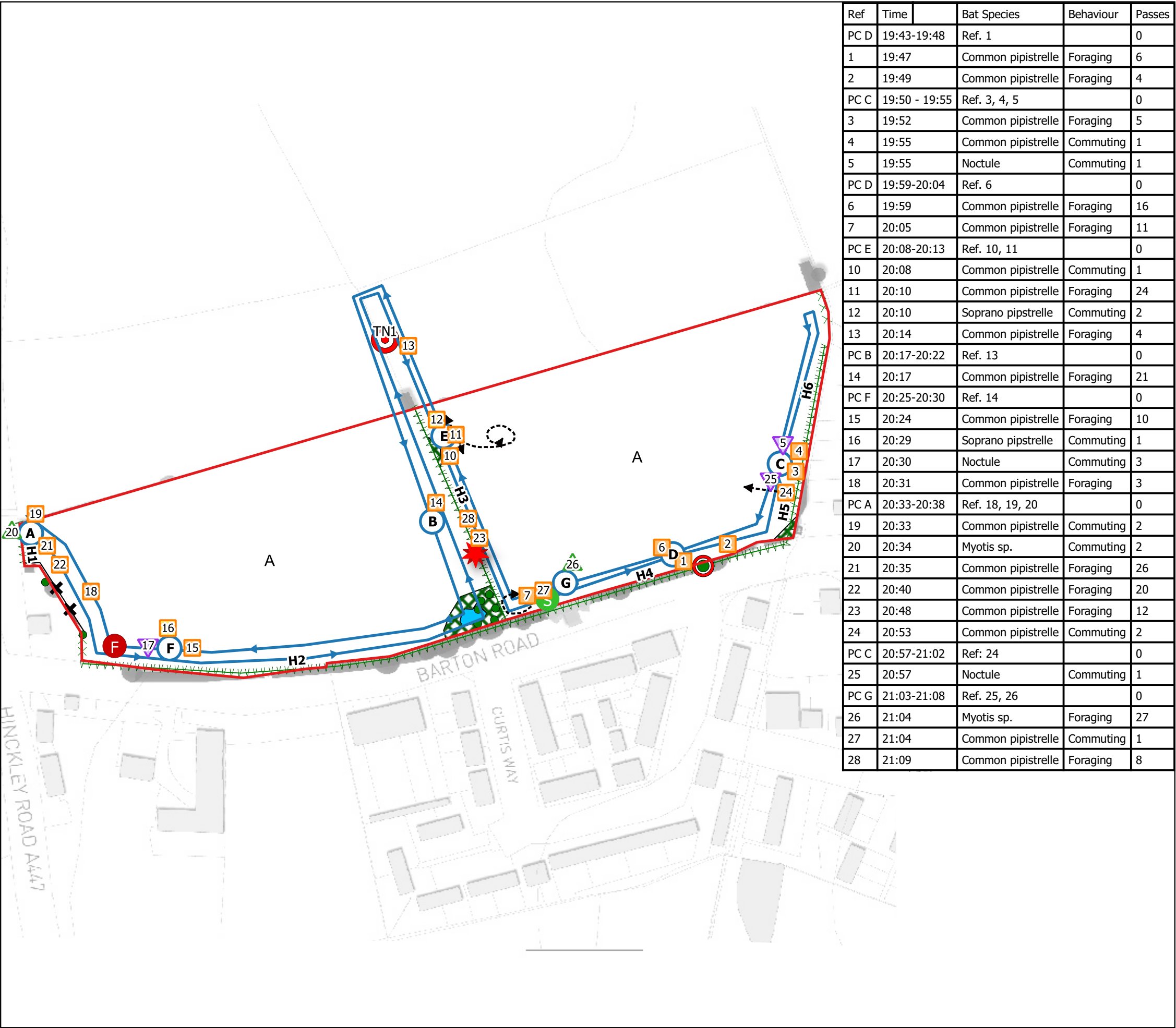
scale @ A3
1:1750

drawn
AJC/JT

issue
19/12/2019

drawing / figure number
Figure 3

rev
-



Ref	Time	Bat Species	Behaviour	Passes
PC D	19:43-19:48	Ref. 1		0
1	19:47	Common pipistrelle	Foraging	6
2	19:49	Common pipistrelle	Foraging	4
PC C	19:50 - 19:55	Ref. 3, 4, 5		0
3	19:52	Common pipistrelle	Foraging	5
4	19:55	Common pipistrelle	Commuting	1
5	19:55	Noctule	Commuting	1
PC D	19:59-20:04	Ref. 6		0
6	19:59	Common pipistrelle	Foraging	16
7	20:05	Common pipistrelle	Foraging	11
PC E	20:08-20:13	Ref. 10, 11		0
10	20:08	Common pipistrelle	Commuting	1
11	20:10	Common pipistrelle	Foraging	24
12	20:10	Soprano pipistrelle	Commuting	2
13	20:14	Common pipistrelle	Foraging	4
PC B	20:17-20:22	Ref. 13		0
14	20:17	Common pipistrelle	Foraging	21
PC F	20:25-20:30	Ref. 14		0
15	20:24	Common pipistrelle	Foraging	10
16	20:29	Soprano pipistrelle	Commuting	1
17	20:30	Noctule	Commuting	3
18	20:31	Common pipistrelle	Foraging	3
PC A	20:33-20:38	Ref. 18, 19, 20		0
19	20:33	Common pipistrelle	Commuting	2
20	20:34	Myotis sp.	Commuting	2
21	20:35	Common pipistrelle	Foraging	26
22	20:40	Common pipistrelle	Foraging	20
23	20:48	Common pipistrelle	Foraging	12
24	20:53	Common pipistrelle	Commuting	2
PC C	20:57-21:02	Ref: 24		0
25	20:57	Noctule	Commuting	1
PC G	21:03-21:08	Ref. 25, 26		0
26	21:04	Myotis sp.	Foraging	27
27	21:04	Common pipistrelle	Commuting	1
28	21:09	Common pipistrelle	Foraging	8

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- Bat Contacts**
- Common Pipistrelle
 - Soprano Pipistrelle
 - Myotis Species
 - Noctule

